PALISADES GOLF COURSE SUBDIVISION
SOIL RECONNAISSANCE REPORT

MANANA-UKA AND WAIAWA, EWA, OAHU, HAWAII
TAX MAP KEY: 9-6-04: 10 AND 9-7-25: 13

To:
PARK ENGINEERING, INC.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

AUGUST 24, 1973

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

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August 24, 1973

PARK ENGINEERING, INC.
1149 Bethel Street, Room 710
Honolulu, Hawaii 96813

Gentlemen:

Subject: Palisades Golf Course Subdivision
Soil Reconnaissance Report
Manana-Uka and Waiawa, Ewa, Oahu, Hawaii
Tax Map Key: 9-6-04: 10 and 9-7-25: 13

In accordance with your request, a reconnaissance of soil conditions was made for residential development studies at the proposed site of the Palisades Golf Course Subdivision at Manana-Uka and Waiawa, Ewa, Oahu, Hawaii.

The reconnaissance consisted of a review of selected soil and geologic maps, visual observations at the site and random sampling of surface soils.

The soil reconnaissance does not include the sloping areas on the northern and southern sides of the proposed site.

FIELD OBSERVATIONS

The proposed site is located on the south side of Waimano Valley at the foot of the ridge below Waimano Home Road. Komo Mai Drive is located uphill or south and east of the site.

The site generally slopes down towards Waimano Stream at about 5 to 10% gradients. Slopes of about 20 to 30% or steeper were noted along the southerly boundary. Next to Waimano Stream, steeper slopes form the bank of the stream.

The area is mostly grassed. The site was formerly part of a golf course and driving range area. A clubhouse and A.C. paved parking lot are located at the southeast corner of the lot.

An access road crosses the eastern portion of the site and terminates at the City and County of Honolulu sewage treatment plant which is located across Waimano Stream from the site.

Some loose stockpiles of soil and decomposed rock were noted along the north and northwest boundaries of the site.

GEOLOGIC AND SOIL DESCRIPTIONS BY OTHERS

From a review of geologic literature and the U. S. Soil Conservation Service maps of the area, the soils may be generally described as older alluvium formed by the weathering of alluvial fan and talus deposits.

Stearns, "Geologic and Topographic Map, Island of Oahu, USGS 1938":

> Consolidated noncalcareous deposits, older alluvium.

U. S. Soil Conservation Service, "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii," August 1972:

> p. 63 & 64: The soils are classified as Kawaihapai stony clay loam or sandy loam (CL and SM soils).

The average rainfall at the proposed site may vary from 30 to 40 inches annually.

DISCUSSION AND RECOMMENDATIONS

The present plan is to develop the flatter central portion of the site for a residential subdivision. An access roadway is proposed from Komo Mai Drive into the site.

In our opinion, selected areas of the site can be improved for residential development. The following discussion and guidelines should be considered for development studies:

1. Drainage of runoff from the southerly slopes should be carefully considered. Buildings should be avoided in the paths of drainageways, if practicable.

2. Construction of retaining walls on slopes generally should be avoided. A buttress fill or revetment should be considered along the north and west boundaries of the site.

3. Fills should be kept as low as practicable, particularly along the top of bank next to Waimano Stream.

4. Depending on the site grading and location of building on a lot, slab-on-ground or post-and-beam type construction may be considered. Post-and-beam type construction would be preferable on the lots next to Waimano Stream.

5. Buildings should generally be placed about 15 ft away from the top of slope and preferably 20 ft from the top of slope next to Waimano Stream.

6. Good surface drainage away from the foundation of structures should be considered.

7. The bottom of utility trenches should be daylighted and graded to shed water along the low side of the site. The backfill and drainage of utility trenches should be carefully designed. Flexible connections should be used.

8. Although not noticed during the field reconnaissance, unforeseen conditions such as soft spots, clayey soils (adobe) or seepage water may exist. Planning should be kept flexible as adjustments may have to be made in these areas.

ADDITIONAL SOIL EXPLORATIONS

More detailed soil explorations should be made at a later date when more definitive plans are prepared.

Exploratory borings and/or open pits should be made to obtain more soil information.

The grading plans should be reviewed and revised to suit soil conditions to minimize future foundation problems.

Attached are a location sketch, laboratory test results, and limitations.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Ezra Koike
Ezra Koike

JWS/EK:rmf

PALISADES GOLF COURSE SUBDIVISION

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	"A"	"B"	"C"	"D"
SAMPLE NO.	SURFACE	SURFACE	SURFACE	SURFACE
DEPTH BELOW SURFACE				
DESCRIPTION	BROWN, SILTY CLAY W/ SAND & GRAVEL	BROWN, SILTY CLAY	REDDISH-BROWN SILTY CLAY	BROWN, SILTY CLAY
GRAIN-SIZE ANALYSIS (% Passing) Sieve				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL	NATURAL	NATURAL	NATURAL
Liquid Limit	63	67	64	65
Plastic Limit	37	39	38	37
Plasticity Index	26	28	26	28
Dilatancy	NONE	NONE	NONE	NONE
Toughness	MED - HIGH	MED-HIGH	MED - HIGH	MED- HIGH
Dry Strength	MED-HIGH	MEDIUM	MED - HIGH	MEDIUM
UNIFIED SOIL CLASSIFICATION	MH	MH	MH	MH
APPARENT SPECIFIC GRAVITY				
EXPANSION AND CBR TESTS (Surcharge-51 P.S.F.)				
Molding Moisture, %				
Molding Dry Density, P.C.F.				
Swell upon saturation, %				
CBR at 0.1" Penetration				
MOISTURE-DENSITY RELATIONS OF SOILS (AASHO T-180-57 Method ___)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS:

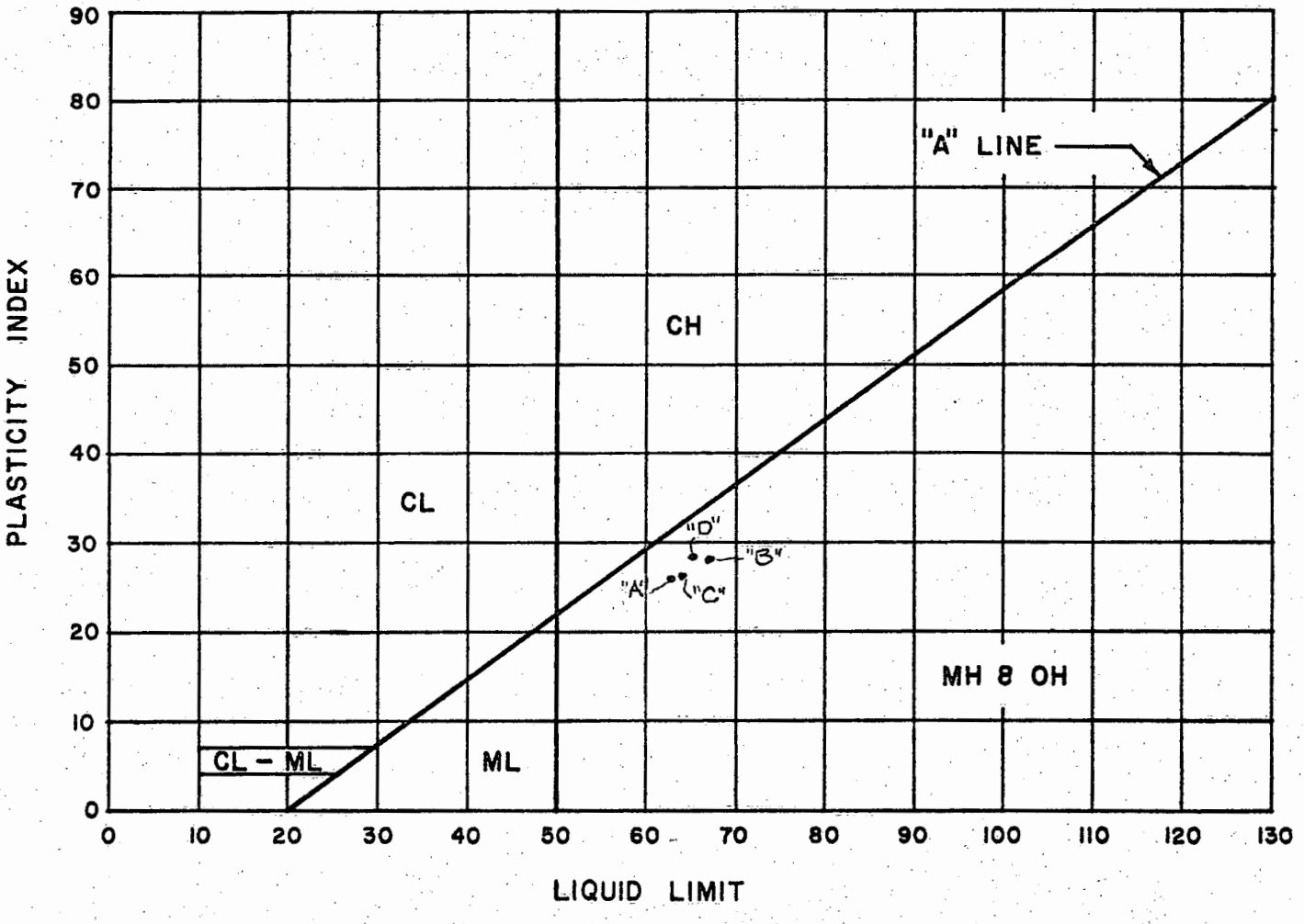
WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 8-24-73 By J.S.

PLASTICITY CHART

PROJECT: PALISADES GOLF COURSE SUBDIVISION

LOCATION: MANANA-UKA & WAIAWA, EWA, OAHU, HAWAII



DATE 8-24-73 BY J.S.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

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LIMITATIONS

If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes, plan changes, or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the recommendations considering the time lapse and the changed conditions.

Our professional services were performed, findings obtained and recommendations prepared in accordance with generally accepted engineering practices. This warranty is in lieu of all other warranties expressed or implied.